

WHAT IS CLAIMED IS:

1. A catalyst-carried filter comprising:

a honeycomb structure including a plurality of cells which are partitioned by partition walls constituted of a porous ceramic including a large number of pores to constitute a channel of a gas; and

an oxidation catalyst which is carried on the surfaces of the partition walls and inner walls of the pores existing in the partition walls to promote oxidation of particulates contained in an exhaust gas, the plurality of cells including one opening end and the other opening end which are alternately clogged,

wherein the plurality of cells include exhaust gas inflow cells whose one opening end is clogged and in which the oxidation catalyst is carried on the surfaces of the partition walls, and purified gas outflow cells whose other opening end is clogged, the exhaust gas inflow cells and the purified gas outflow cells are alternately arranged, and at least one fine coating layer constituted of a porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall is formed on the surface of the partition wall on the side of the purified gas outflow cell.

2. The catalyst-carried filter according to claim 1, wherein the average pore diameter of the porous ceramic constituting the partition wall is 15 to 300 μm , and the

average pore diameter of the porous ceramic constituting the fine coating layer is 5 to 50 μm .

3. The catalyst-carried filter according to claim 2, wherein the porous ceramic constituting the partition wall has a porosity of 40 to 75%, and the porous ceramic constituting the fine coating layer has a porosity of 45 to 85%.

4. The catalyst-carried filter according to claim 3, wherein the porosity of the porous ceramic constituting the partition wall is smaller than that of the porous ceramic constituting the fine coating layer by 5% or more.

5. A catalyst-carried filter comprising:
a honeycomb structure including a plurality of cells which are partitioned by partition walls constituted of a porous ceramic including a large number of pores to constitute a channel of a gas; and

an oxidation catalyst which is carried on the surfaces of the partition walls and inner walls of the pores existing in the partition walls to promote oxidation of particulates contained in an exhaust gas, the plurality of cells including one opening end and the other opening end which are alternately clogged,

wherein the plurality of cells include exhaust gas inflow cells whose one opening end is clogged and in which

the oxidation catalyst is carried on the surfaces of the partition walls, and purified gas outflow cells whose other opening end is clogged, the exhaust gas inflow cells and the purified gas outflow cells are alternately arranged, and at least one particulate layer filled with a porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall is formed on an inner portion of the pore existing in the partition wall on the side of the purified gas outflow cell.

6. The catalyst-carried filter according to claim 5, wherein the average pore diameter of the porous ceramic constituting the partition wall is 15 to 300 μm , and the average pore diameter of the porous ceramic constituting the particulate layer is 5 to 50 μm .

7. The catalyst-carried filter according to claim 6, wherein the porous ceramic constituting the partition wall has a porosity of 40 to 75%, and the porous ceramic constituting the particulate layer has a porosity of 45 to 85%.

8. The catalyst-carried filter according to claim 7, wherein the porosity of the porous ceramic constituting the partition wall is smaller than that of the porous ceramic constituting the particulate layer by 5% or more.

9. A catalyst-carried filter comprising:

a honeycomb structure including a plurality of cells which are partitioned by partition walls constituted of a porous ceramic including a large number of pores to constitute a channel of a gas; and

an oxidation catalyst which is carried on the surfaces of the partition walls and inner walls of the pores existing in the partition walls to promote oxidation of particulates contained in an exhaust gas, the plurality of cells including one opening end and the other opening end which are alternately clogged,

wherein the plurality of cells include exhaust gas inflow cells whose one opening end is clogged and in which the oxidation catalyst is carried on the surfaces of the partition walls, and purified gas outflow cells whose other opening end is clogged, the exhaust gas inflow cells and the purified gas outflow cells are alternately arranged, at least one coarse coating layer constituted of a porous ceramic having an average pore diameter larger than that of the porous ceramic constituting the partition wall is formed on the surface of the partition wall on the side of the exhaust gas inflow cell, and the oxidation catalyst is carried on the surface of the coarse coating layer and the inner walls of the pores existing in the coarse coating layer.

10. The catalyst-carried filter according to

claim 9, wherein the average pore diameter of the porous ceramic constituting the partition wall is 5 to 50 μm , and the average pore diameter of the porous ceramic constituting the coarse coating layer is 15 to 300 μm .

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11. The catalyst-carried filter according to claim 10, wherein the porous ceramic constituting the partition wall has a porosity of 45 to 80%, and the porous ceramic constituting the coarse coating layer has a porosity of 40 to 75%.

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12. The catalyst-carried filter according to claim 11, wherein the porosity of the porous ceramic constituting the partition wall is larger than that of the porous ceramic constituting the coarse coating layer by 5% or more.

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13. The catalyst-carried filter according to claim 9, further comprising: at least one fine coating layer which is constituted of a porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall and which is formed on the surface of the partition wall on the purified gas outflow cell side.

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14. The catalyst-carried filter according to claim 9, further comprising: at least one particulate layer

which is filled with the porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall and which is formed on the purified gas outflow cell side inside the pore existing in
5 the partition wall.

15. An exhaust gas purifying system comprising:
an exhaust gas channel extending from an internal combustion engine constituted so as to exhaust an exhaust
10 gas having a content of particulates which is 0.1 (g/kWh) or less; and
the catalyst-carried filter according to claim 1 in the exhaust gas channel.

15 16. An exhaust gas purifying system comprising:
an exhaust gas channel extending from an internal combustion engine constituted so as to exhaust an exhaust gas having a content of particulates which is 0.1 (g/kWh) or less; and
20 the catalyst-carried filter according to claim 5 in the exhaust gas channel.

17. An exhaust gas purifying system comprising:
an exhaust gas channel extending from an internal
25 combustion engine constituted so as to exhaust an exhaust gas having a content of particulates which is 0.1 (g/kWh) or less; and

the catalyst-carried filter according to claim 9 in the exhaust gas channel.

18. A catalyst body comprising:

5 a honeycomb structure including a plurality of cells which are partitioned by partition walls constituted of a porous ceramic including a large number of pores to constitute a channel of a gas; and

an oxidation catalyst which is carried on the
10 surfaces of the partition walls and inner walls of the pores existing in the partition walls to promote oxidation of particulates contained in an exhaust gas,

wherein the plurality of cells include fine coating layer forming cells in which at least one fine
15 coating layer constituted of a porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall is formed on the surface of the partition wall, and fine coating layer non-forming cells in which the fine coating layer is not formed
20 on the surface of the partition wall.

19. A catalyst body comprising:

a honeycomb structure including a plurality of cells which are partitioned by partition walls constituted
25 of a porous ceramic including a large number of pores to constitute a channel of a gas; and

an oxidation catalyst which is carried on the

surfaces of the partition walls and inner walls of the pores existing in the partition walls to promote oxidation of particulates contained in an exhaust gas,

5 wherein the plurality of cells include particulate layer forming cells in which at least one particulate layer filled with a porous ceramic having an average pore diameter smaller than that of the porous ceramic constituting the partition wall is formed on the surface of the partition wall inside the pores existing in the
10 partition wall, and particulate layer non-forming cells in which the particulate layer is not formed on the surface of the partition wall.

20. A catalyst body comprising:

15 a honeycomb structure including a plurality of cells which are constituted of a porous ceramic including a large number of pores and which are partitioned by partition walls to constitute a channel of a gas; and

20 an oxidation catalyst for promoting oxidation of particulates contained in an exhaust gas, the oxidation catalyst being carried on the surfaces of the partition walls constituting the plurality of cells and inner walls of the pores existing in the partition walls,

25 wherein the plurality of cells include coarse coating layer forming cells in which at least one coarse coating layer constituted of a porous ceramic having an average pore diameter larger than that of the porous

ceramic constituting the partition wall is formed on the surface of the partition wall, and coarse coating layer non-forming cells in which the coarse coating layer is not formed on the surface of the partition wall.